

REMARKS

Reconsideration and further examination is respectfully requested. Claims 1-18 are pending in this application.

Rejections under 35 U.S.C. §112, first paragraph

Claims 3, 8, 13 and 17 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. In particular, the claims were objected to for using the term 'without switching.' Applicant has amended the claims to more clearly recite "...a plurality of demultiplexed optical data streams from the demultiplexing logic and only selectively drop or pass each demultiplexed optical data stream to the output of the dropping/passing logic without adding new optical data streams..." Support for such an amendment can be found at paragraph 32 of Applicant's specification, which states "the drop-only fabric 220 may include single-sided mirrors that can be configured to drop but not add optical data streams..." Accordingly, in view of this amendment it is requested that the rejection be withdrawn.

Rejections under 35 U.S.C. §102

Claims 11-18 were rejected under 35 U.S.C. §102(e) as being anticipated by Nishi et al (U.S. Pub. No. 2002/0044718).

The Applicant and the Examiner have exchanged several papers during the prosecution of this application. A particular disagreement remains between the Applicant and the Examiner as to whether the prior art cited by the Examiner teaches or suggests the structure of the photonic switching system claimed in the present invention. For example, as shown in Figure 2 of Applicant's specification, the photonic switch of the claimed invention includes a demultiplexing stage in which optical data streams on an optical fiber are separated into discrete optical data

streams, a drop only stage embodied in drop only fabric 220, at which optical data streams are either selectively dropped or passed to a photonic cross connect switch, a switching stage, where the optical data streams are switched among fibers, and a combiner stage, where new optical data signals are added into the switched optical data stream prior to transmission on an output optical medium. As mentioned at page 3, paragraph 34, one advantage of the architecture of the present invention is that it permits the size of the photonic switch to be substantially equal in size and cost to an add/drop multiplexer capable of adding and dropping all wavelengths.

In contrast, Nishi describes a different architecture, as described below.

Nishi:

Nishi describes, in the Abstract:

“...An optical switch has first to fourth optical matrix switches in each of which a plurality of 2-input/2-output optical switch elements are arranged in a matrix to form a plurality of input ports, a plurality of auxiliary input ports, a plurality of output ports, and a plurality of auxiliary output ports. The auxiliary output ports in the first optical matrix switch are connected to the respective input ports in the third optical matrix switch, the output ports in the second optical matrix switch are connected to the respective auxiliary input ports in the third optical matrix switch, the output ports in the first optical matrix switch are connected to the respective auxiliary input ports in the fourth optical matrix switch, and the auxiliary output ports in the second optical matrix switch are connected to the respective input ports in the fourth optical matrix switch...”

Thus Nishi describes an entirely different architecture, where a series of matrix switches are chained together, each matrix switch capable configured to selectively drop, pass **or add**, optical data streams. Such architecture is fundamentally different than that of the claimed invention.

The Examiner states, at pages 2-3 of the Office Action:

“... Regarding claims 11 and 15, Nishi et al disclose ... demultiplexing logic ((41-2) and (41-2)) for demultiplexing optical data streams ... dropping/passing logic operable coupled to the

demultiplexing logic for receiving the demultiplexed optical data streams from the demultiplexing logic and selectively dropping or passing each multiplexed data stream ((42-1) and (42-2) is a dropping/passing logic coupled to the demultiplexer ((41-1) and (41-2); in the specification, as originally filed, on page 8 lines 6-10 applicant disclosed that the dropping fabric may use any variety of photonic switching technologies, therefore based on this, the photonic switches (42-1) and (42-2) of Nishi et al are considered as drop fabrics...”

In a prior amendment, Applicant amended the claims to recite that the dropping/passing logic is ‘configured to only selectively drop or pass’. Although Applicant’s instant specification states that a switch can be used to effectuate selective dropping or passing, the switch of Nishi is **not ‘configured to only selectively drop or pass’** as recited in the claims. Rather, Nishi describes a full switch, with an architecture that necessitates that each of the switch matrices includes the ability to also add signals; Applicant respectfully submits that the Examiner is not affording patentable weight to the terms ‘**only selectively drop or pass**’ as used by the Applicant.

In response to this argument, the Examiner states at page 12 “... However, Nishi et al show dropping/passing logic (111) shown in Fig. 1, to pass optical channel through or reflect the optical channel downward. Downward reflection is considered as dropping the optical channel. Therefore the prior arts disclose the switch configured to only selectively drop or pass the optical channel...”

Applicants respectfully disagree with the Examiner’s interpretation of element 111 of Nishi as being configured to ‘**only selectively drop or pass.**’ Applicants note that element 11-1 includes Auxiliary input ports XP1 – XPn. These input ports are **added** at device 11-1. As described in Nishi, at page 3, paragraph 41:

“... an optical switch comprising first to fourth optical matrix switches 11-1 to 11-4 in each of which a plurality of 2-input/2-output optical switch elements are arranged in a matrix and a plurality of input ports P, *a plurality of auxiliary input ports XP*, a plurality of output ports O, and a plurality of auxiliary output ports XO are formed, wherein the auxiliary output ports XO in the first optical matrix switch 11-1 are connected to the respective input ports P of the third optical matrix switch 11-3, the output ports O in the second optical matrix switch 11-2 are connected to the respective auxiliary input ports XP in the third optical matrix switch 11-3, the output ports O in the first optical matrix switch 11-1 are connected to the respective auxiliary input ports XP in the fourth optical matrix switch 11-4, and the auxiliary output ports XO in the second optical matrix switch 11-2 are connected to the respective input ports P in the fourth optical matrix switch 11-4....”

Thus, the matrices of Nishi are configured to add, drop or pass, which is different than the drop-only fabric of Applicant's claimed invention. Affording any other interpretation to the matrix of Nishi is not giving patentable weight to the limitation of the term 'configured to only selectively pass or drop...' as recited in the claims.

Applicant's claim 11, as amended, recites the limitation of “... dropping/passing logic operably coupled to the demultiplexing logic for receiving the demultiplexed optical data streams from the demultiplexing logic and *configured to only selectively drop or pass each demultiplexed optical data stream* to an output of the dropping/passing logic” Such a structure is patentably distinct over the switch structure shown and described in Nishi Accordingly, for at least the reason that Nishi fails to disclose or suggest every limitation in the claim, claim 11 is patentably distinct over Nishi, and the rejection should be withdrawn. Dependent claims 12-14 serve to further limit claim 11 and are therefore allowable with claim 11.

Independent claim 15 has been amended to recite “... dropping/passing logic operably coupled to the demultiplexing logic for receiving the demultiplexed optical data streams from the demultiplexing logic and *configured to only selectively drop or pass each demultiplexed optical data stream* to an output of the dropping/passing logic...” As described above, no such structure

is shown in Nishi, which in fact shows a cross-bar switch where each input is connectable to each output, and *thus no capacity for dropping the data stream is provided*. For at least this reason, claim 15 is patentably distinct over Nishi, and the rejection should be withdrawn. Dependent claims 16-18 serve to further limit independent claim 15 and are allowable for at least the same reasons as claim 15.

Rejections under 35 U.S.C. §103

Claims 1-18 were rejected to under 35 U.S.C. §103(a) as being unpatentable over Kaminow et al. (U.S. Patent No.: 5,623,3536) in view of Bortz (U.S. Patent 6,771,905). Claims 1-10 were rejected to under 35 U.S.C. §103(a) as being unpatentable over Nishi et al. (U.S. Pub. No. 2002/0044718) in view of Kaminow et al. (U.S. Patent No. 5,623,356).

Kaminow:

Kaminow describes a combined wavelength router and switch apparatus for use in an optical communication system. The apparatus includes arrays of optical signal demultiplexers, wavelength division switches, space division switches and multiplexers, arranged in a manner that can increase the connectivity of an optical system using wavelength division multiplexed (WDM) signals. In several embodiments, time-multiplexed wavelength division switches and time-multiplexed space division switches may be used to increase further the degree of connectivity of the system or to reduce the number of wavelength division switches and space division switches required. (Kaminow, Abstract)

Bortz:

Bortz describes an optical system including an optical switching device generally configured to control signal characteristic profiles over the pluralities of signal channels, or wavelengths, to provide desired signal characteristic profiles at the output ports of the device. (Bortz, Abstract).

The Examiner states, at pages 4-5 of the office action, in part:

“Regarding claims 1 and 6, Kaminow et al disclose dropping/passing logic operable coupled to the demultiplexing logic for receiving the demultiplexed optical data streams from the demultiplexing logic and selectively dropping or passing each demultiplexed optical data stream ((111₁) to (111_N)) is a dropping/passing logic coupled to the demultiplexer ((105₁) to (105_N); in the specification, as originally filed, on page 8 lines 6-10 applicant disclosed that the dropping fabric may use any variety of photonic switching technologies, therefore based on this, the photonic switches (111₁) to (111_N) of Kaminow et al are considered as drop fabrics)...”

“... Kaminow et al show photonic switching as discussed and differ from the claimed invention in that Kaminow et al do not specifically disclose that the switch is switching each passed optical data stream to an output port of the photonic switching logic. However, such concept is well known. Bortz is cited to show switching device that is capable of switching each optical data stream to an output of the switch.... Therefore it would have been obvious to an artisan of ordinary skill in the art at the time of the invention was made to replace the switch of Kaminow et al with that of Bortz in order to switch multiple data stream from various input ports of the switch to an output port. One of ordinary skill in the art would have been motivated to do this in order to route plurality of signals from various sources into a single path...”

It is well known that in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Applicants have amended each independent claim to recite the limitation of "...dropping/passing logic operably coupled to the demultiplexing logic for receiving the demultiplexed optical data streams from the demultiplexing logic and *configured to only selectively drop or pass each demultiplexed optical data stream* to an output of the dropping/passing logic..." No such structure is shown or suggested in the prior art references cited by the Examiner, either alone or in combination. As described above, Nishi discloses a cross-bar matrix. Kaminow describes, at column 1, lines 46-49 "...The wavelength router/switch also includes an array of N optical signal wavelength division switches, each of which is coupled optically to a respective one of the sets of F output ports and each of which includes a set of F' output ports. *The wavelength division switches preferably shift the frequency or wavelength of optical carrier signals while maintaining the data modulation of the original signals....*" No mention is made in Kaminow that the wavelength switches **'are configured to only selectively drop or pass'** data streams as recited in the claims. Bortz describes, at column 4 lines 46-48 "...Optical systems of the present invention generally include at least one optical processing device, such as optical cross-connect switches and routers, as well as add/drop multiplexers, disposed along an optical path between transmitting and receiving optical processing nodes..." Each such

system includes complex operations such as signal or wavelength switching to demultiplexed optical inputs. In contrast, the dropping/passing logic of the present invention is “...*configured to only selectively drop or pass each demultiplexed optical data stream* to an output of the dropping/passing logic ...”

Accordingly, for at least the reason that the combination of references fails to teach or describe every limitation in independent claims 1, 6, 11 and 15, it is submitted that the rejection is overcome and should be withdrawn. Dependent claims 2-5, 7-10, 12-14 and 16-18 serve to further limit respective parent claims 1, 6, 11 and 15 and are therefore allowable at least for the same reason as their respective parent claims. Accordingly it is requested that the rejections under 35 U.S.C. §103 over the Nishi, Kaminow and Bortz references be withdrawn.

Conclusion:

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Lindsay G. McGuinness, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

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Date

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